Algebra Word Problems in One Variable

Activities by Jill

Algebra: Word Problems in One Variable A **Name: _____**

Write and solve an equation for each problem. Define variables for #7-15.

1. The sum of 42 and twice a number is 164. Find the number.

2. Seven more than three times a number is 166. Find the number.

3. Three less than half of a number is twenty-five. Find the number.

4. When half of a number is decreased by 24, the result is 95. Find the number.

5. Six more than two thirds of a number is 36. Find the number.

6. Nine less than one fourth of a number is 31. Find the number.

7. Find three consecutive integers whose sum is 306.

8. Find three consecutive odd integers whose sum is 93.

9. Ike's Igloo sold 501 ice cream cones today. They sold half as many chocolate ice cream cones as vanilla ones. How many of each kind were sold?

10. Kevin earned $325 more last week than his friend, Janet. Together, they earned a total of $1089. How much did each earn?

11. Lilly currently has $80. If she saves $12.50 per week, how long will it take her to have $780?

12. A rectangle has a length that is 11 more than the width. The perimeter is 90 meters. Find the dimensions of the rectangle.

13. A rectangle with a perimeter of 232 feet has a width of 36 feet. What is the rectangle's length?

14. The length of a rectangle is 16 m less than the width. Find the dimensions if the perimeter is 100 m.

15. The perimeter of a rectangle is 450 cm and the length is 150 cm. Find the width.

Solve each equation. Be sure to show all work clearly.

16. $23c + 88 = 15c$

17. $\frac{45 - y}{2} = 7y$

18. $\frac{2}{3}x - 4 = x$

19. $-w = \frac{7 - 5w}{5}$

20. $6\left(4 + y\right) - y = 4\left(6 + y\right) + y$

Algebra: Word Problems in One Variable A **Name:** Answer Key

Write and solve an equation for each problem. Define variables for #7-15.

1. The sum of 42 and twice a number is 164. Find the number.

$42+2x=164$

$2x=122$

$x=61$

2. Seven more than three times a number is 166. Find the number.

$7+3x=166$

$3x=159$

$x=53$

3. Three less than half of a number is twenty-five. Find the number.

$\frac{1}{2}x-3=25$

$\frac{1}{2}x=28$

$x=56$

4. When half of a number is decreased by 24, the result is 95. Find the number.

$\frac{1}{2}x-24=95$

$\frac{1}{2}x=119$

$x=238$

5. Six more than two thirds of a number is 36. Find the number.

$\frac{2}{3}x+6=36$

$\frac{2}{3}x=30$

$x=45$

6. Nine less than one fourth of a number is 31. Find the number.

$\frac{1}{4}x-9=31$

$\frac{1}{4}x=40$

$x=160$

7. Find three consecutive integers whose sum is 306.

1st : x
2nd : x+1
3rd : x+2

$x+x+1+x+2=306$

$3x+3=306$

$3x=303$

$x=101$

101,102,103

8. Find three consecutive odd integers whose sum is 93.

1st : x
2nd : x+2
3rd : x+4

$x+x+2+x+4=93$

$3x+6=93$

$3x=87$

$x=29$

29,31,33

9. Ike's Igloo sold 501 ice cream cones today. They sold half as many chocolate ice cream cones as vanilla ones. How many of each kind were sold?

chocolate : c
vanilla : 2c

$c+2c=501$

$3c=501$

$c=167$

chocolate : 167
vanilla : 334

10. Kevin earned $325 more last week than his friend, Janet. Together, they earned a total of $1089. How much did each earn?

Janet : j
Kevin : j+325

$j+j+325=1089$

$2j+325=1089$

$2j=764$

$j=382$

Janet : $382
Kevin : $707

Answer Key

11. Lilly currently has $80. If she saves $12.50 per week, how long will it take her to have $780?

weeks: w

$80 + 12.50w = 780$

$12.50w = 700$

$w = 56$

56 weeks

12. A rectangle has a length that is 11 more than the width. The perimeter is 90 meters. Find the dimensions of the rectangle.

width: w

length: w + 11

$2w + 2(w + 11) = 90$

$2w + 2w + 22 = 90$

$4w + 22 = 90$

$4w = 68$

$w = 17$

width: 17m

length: 28m

13. A rectangle with a perimeter of 232 feet has a width of 36 feet. What is the rectangle's length?

width: 36

length: x

$2x + 2(36) = 232$

$2x + 72 = 232$

$2x = 160$

$x = 80$

length: 80ft

14. The length of a rectangle is 16 m less than the width. Find the dimensions if the perimeter is 100 m.

width: w

length: w − 16

$2w + 2(w - 16) = 100$

$2w + 2w - 32 = 100$

$4w - 32 = 100$

$4w = 132$

$w = 33$

width: 33m

length: 17m

15. The perimeter of a rectangle is 450 cm and the length is 150 cm. Find the width.

width: w

length: 150

$2w + 2(150) = 450$

$2w + 300 = 450$

$2w = 150$

$w = 75$

width: 75cm

Solve each equation. Be sure to show all work clearly.

16. $23c + 88 = 15c$

$88 = -8c$

$c = -11$

17. $\frac{45 - y}{2} = 7y$

$45 - y = 14y$

$45 = 15y$

$y = 3$

18. $\frac{2}{3}x - 4 = x$

$-4 = \frac{1}{3}x$

$x = -12$

19. $-w = \frac{7 - 5w}{5}$

$-5w = 7 - 5w$

$0 \neq 7$

No Solution

20. $6(4 + y) - y = 4(6 + y) + y$

$24 + 6y - y = 24 + 4y + y$

$5y + 24 = 5y + 24$

$24 = 24$

Identity

Algebra: Word Problems in One Variable B **Name: _____**

Write and solve an equation for each problem. Define variables for #8-15.

1. A number is 38 more than its opposite. Find the number.

2. 5 less than a number is equal to its opposite. Find the number.

3. Fifteen more than a number is the same as twice its opposite. Find the number.

4. A number is 76 less than its opposite. Find the number.

5. Find the number whose sum with five is the same as its product with two.

6. The sum of 85 and twice a number is 229. Find the number.

7. Six times a number increased by 13 is -173. Find the number.

8. Find four consecutive odd integers whose sum is -200.

9. Find five consecutive integers whose sum is -85.

10. The perimeter of a rectangle is 856 and the length is 84. Find the width.

11. While unpacking new towels at a health club, a worker notices that one of two boxes holds 10 towels more than the other. There are 90 towels in all. How many towels does each box hold?

12. The sum of two numbers is 18. Five times one of the numbers is 8 less than twice the other. Find the numbers.

13. Jason has 3 times as much money as Bill, while Bill has $1 more than Sam. If they have $149 all together, how much money does each of them have?

14. Two numbers have a difference of 8. Three times the smaller number is four less than twice the larger number. Find the numbers.

15. Two numbers have a sum of 44. The quotient of the larger number and three is 12 more than the smaller number. Find the numbers.

Algebra: Word Problems in One Variable B **Name:** Answer Key

Write and solve an equation for each problem. Define variables for #8-15.

1. A number is 38 more than its opposite. Find the number.

$n = 38 + (-n)$ or $n = 38 - n$

$2n = 38$

$n = 19$

19

2. 5 less than a number is equal to its opposite. Find the number.

$n - 5 = -n$

$-5 = -2n$

$n = \frac{5}{2} = 2\frac{1}{2} = 2.5$

2.5

3. Fifteen more than a number is the same as twice its opposite. Find the number.

$15 + n = 2(-n)$ or $15 + n = -2n$

$15 = -3n$

$n = -5$

−5

4. A number is 76 less than its opposite. Find the number.

$n = -n - 76$

$2n = -76$

$n = -38$

−38

5. Find the number whose sum with five is the same as its product with two.

$n + 5 = 2n$

$n = 5$

5

6. The sum of 85 and twice a number is 229. Find the number.

$2n + 85 = 229$

$2n = 144$

$n = 72$

72

7. Six times a number increased by 13 is -173. Find the number.

$6n + 13 = -173$

$6n = -186$

$n = -31$

−31

8. Find four consecutive odd integers whose sum is -200.

1st : x

2nd : $x + 2$

3rd : $x + 4$

4th : $x + 6$

$x + x + 2 + x + 4 + x + 6 = -200$

$4x + 12 = -200$

$4x = -212$

$x = -53$

−53, −51, −49, −47

Answer Key

9. Find five consecutive integers whose sum is -85.

$1st: x$
$2nd: x+1$
$3rd: x+2$
$4th: x+3$
$5th: x+4$

$x+x+1+x+2+x+3+x+4=-85$
$5x+10=-85$
$5x=-95$
$x=-19$

$-19,-18,-17,-16,-15$

10. The perimeter of a rectangle is 856 and the length is 84. Find the width.

$width: w$
$length: 84$

$2w+2(84)=856$
$2w+168=856$
$2w=688$
$w=344$

$width: 344$

11. While unpacking new towels at a health club, a worker notices that one of two boxes holds 10 towels more than the other. There are 90 towels in all. How many towels does each box hold?

$box\#1: t$
$box\#2: t+10$

$t+t+10=90$
$2t+10=90$
$2t=80$
$t=40$

$box\#1: 40$
$box\#2: 50$

12. The sum of two numbers is 18. Five times one of the numbers is 8 less than twice the other. Find the numbers.

$1st\#: x$
$2nd\#: 18-x$

$5x=2(18-x)-8$
$5x=36-2x-8$
$5x=-2x+28$
$7x=28$
$x=4$

$1st\#: 4$
$2nd\#: 14$

13. Jason has 3 times as much money as Bill, while Bill has $1 more than Sam. If they have $149 all together, how much money does each of them have?

$Jason: 3(s+1)$
$Bill: s+1$
$Sam: s$

$3(s+1)+s+1+s=149$
$3s+3+s+1+s=149$
$5s+4=149$
$5s=145$
$s=29$

$Jason: \$90$
$Bill: \$30$
$Sam: \$29$

14. Two numbers have a difference of 8. Three times the smaller number is four less than twice the larger number. Find the numbers.

$1st\#: x$
$2nd\#: x+8$

$3x=2(x+8)-4$
$3x=2x+16-4$
$3x=2x+12$
$x=12$

$1st\#: 12$
$2nd\#: 20$

15. Two numbers have a sum of 44. The quotient of the larger number and three is 12 more than the smaller number. Find the numbers.

$1st\#: x$
$2nd\#: 44-x$

$\frac{44-x}{3}=12+x$
$44-x=3(12+x)$
$44-x=36+3x$
$44=36+4x$
$4x=8$
$x=2$

$1st\#: 2$
$2nd\#: 42$

Algebra: Word Problems in One Variable C Name: _____

Write and solve an equation for each problem. Define variables for #5-16.

1. Eight less than half of a number is 52. Find the number.

2. A number is eighteen less than twice its opposite. Find the number.

3. The product of a number and six is the same as twenty-one more than the number's opposite. Find the number.

4. Thirty-five less than a number is the same as the product of four and the number's opposite. Find the number.

5. Find three consecutive integers whose sum is 141.

6. Find four consecutive odd integers such than seven times the smallest equals the largest.

7. The smaller of two consecutive even numbers is seventy-four less than the product of the larger number and ten. Find the numbers.

8. The perimeter of a rectangle is 88 cm. The length is two centimeters longer than the width. Find the dimensions of the rectangle.

9. Find two consecutive even integers whose sum is -210.

10. A picnic table has a perimeter of 30 feet. The table is twice as long as it is wide. What are the dimensions of the picnic table?

11. A rectangle is 8 meters longer than it is wide. The perimeter is 104 meters. Find the dimensions of the rectangle.

12. 400 people bought tickets to a football game. Student admission was $2 while adult admission was $3. The total amount of ticket sales was $1050. How many tickets of each type were sold?

13. The sum of two numbers is 87. Two more than twice the smaller number is ten less than the larger number. Find the numbers.

14. The sum of two numbers is 28. The quotient of the larger number and 4 is the same as the smaller number increased by 12. Find the numbers.

15. Two numbers differ by six. The quotient of the smaller number and two is ten more than the larger number. Find the numbers.

16. Two numbers differ by nine. The product of two thirds and the larger number is the smaller number. Find the numbers.

Algebra: Word Problems in One Variable C **Name:** Answer Key

Write and solve an equation for each problem. Define variables for #5-16.

1. Eight less than half of a number is 52. Find the number.

$$\frac{1}{2}n - 8 = 52$$
$$\frac{1}{2}n = 60$$
$$n = 120$$

2. A number is eighteen less than twice its opposite. Find the number.

$$n = -2n - 18$$
$$3n = -18$$
$$n = -6$$

3. The product of a number and six is the same as twenty-one more than the number's opposite. Find the number.

$$6n = -n + 21$$
$$7n = 21$$
$$n = 3$$

4. Thirty-five less than a number is the same as the product of four and the number's opposite. Find the number.

$$n - 35 = -4n$$
$$-5n = -35$$
$$n = 7$$

5. Find three consecutive integers whose sum is 141.

$1st : x$
$2nd : x + 1$
$3rd : x + 2$

$$x + x + 1 + x + 2 = 141$$
$$3x + 3 = 141$$
$$3x = 138$$
$$x = 46$$

$46, 47, 48$

6. Find four consecutive odd integers such than seven times the smallest equals the largest.

$1st\ odd : x$
$2nd\ odd : x + 2$
$3rd\ odd : x + 4$
$4th\ odd : x + 6$

$$7x = x + 6$$
$$6x = 6$$
$$x = 1$$

$1, 3, 5, 7$

7. The smaller of two consecutive even numbers is seventy-four less than the product of the larger number and ten. Find the numbers.

$1st\ even : x$
$2nd\ even : x + 2$

$$x = 10(x + 2) - 74$$
$$x = 10x + 20 - 74$$
$$x = 10x - 54$$
$$-9x = -54$$
$$x = 6$$

$6, 8$

8. The perimeter of a rectangle is 88 cm. The length is two centimeters longer than the width. Find the dimensions of the rectangle.

$length : w + 2$
$width : w$

$$w + w + w + 2 + w + 2 = 88$$
$$4w + 4 = 88$$
$$4w = 84$$
$$w = 21$$

$width : 21\ cm$
$length : 23\ cm$

Answer Key

9. Find two consecutive even integers whose sum is -210.

$1st\ even: x$
$2nd\ even: x+2$

$x+x+2=-210$
$2x+2=-210$
$2x=-212$
$x=-106$

$-106, -104$

10. A picnic table has a perimeter of 30 feet. The table is twice as long as it is wide. What are the dimensions of the picnic table?

$length: 2w$
$width: w$

$w+w+2w+2w=30$
$6w=30$
$w=5$

$width: 5\ ft$
$length: 10\ ft$

11. A rectangle is 8 meters longer than it is wide. The perimeter is 104 meters. Find the dimensions of the rectangle.

$length: w+8$
$width: w$

$w+w+w+8+w+8=104$
$4w+16=104$
$4w=88$
$w=22$

$width: 22\ m$
$length: 30\ m$

12. 400 people bought tickets to a football game. Student admission was $2 while adult admission was $3. The total amount of ticket sales was $1050. How many tickets of each type were sold?

$adult: a$
$student: 400-a$

$2(400-a)+3a=1050$
$800-2a+3a=1050$
$800+a=1050$
$a=250$

$adult: 250\ tickets$
$student: 150\ tickets$

13. The sum of two numbers is 87. Two more than twice the smaller number is ten less than the larger number. Find the numbers.

$1st: x$
$2nd: 87-x$

$2+2x=87-x-10$
$2+2x=77-x$
$2+3x=77$
$3x=75$
$x=25$

$25, 62$

14. The sum of two numbers is 28. The quotient of the larger number and 4 is the same as the smaller number increased by 12. Find the numbers.

$1st: x$
$2nd: 28-x$

$\frac{x}{4}=28-x+12$
$\frac{x}{4}=40-x$
$x=160-4x$
$5x=160$
$x=32$

$32, -4$

15. Two numbers differ by six. The quotient of the smaller number and two is ten more than the larger number. Find the numbers.

$1st: x$
$2nd: x+6$

$\frac{x}{2}=x+6+10$
$\frac{x}{2}=x+16$
$x=2x+32$
$-x=32$
$x=-32$

$-32, -26$

16. Two numbers differ by nine. The product of two thirds and the larger number is the smaller number. Find the numbers.

$1st: x$
$2nd: x+9$

$\frac{2}{3}(x+9)=x$
$\frac{2}{3}x+6=x$
$2x+18=3x$
$x=18$

$18, 27$

Thank you for purchasing this product.

Positive feedback is always greatly appreciated.

Activities by Jill

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